OM-223 528L 2010–07

Processes

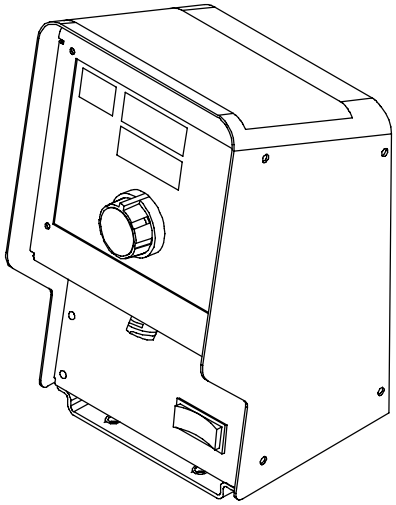
MIG (GMAW) Welding

Description

Wire Feeder

AROI

(Automatic Remote Operator Interface)



OWNER'S MANUAL

File: Advanced Manufacturing Systems

Visit our website at

www.MillerWelds.com/ams

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide the exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual specification sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller®

TABLE OF CONTENTS

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING 1
1-1. Symbol Usage 1
1-2. Arc Welding Hazards 1
1-3. Additional Symbols For Installation, Operation, And Maintenance 3
1-4. California Proposition 65 Warnings 4
1-5. Principal Safety Standards 4
1-6. EMF Information 4
SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION 5
2-1. Symboles utilisés 5
2-2. Dangers relatifs au soudage à l'arc 5
2-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance 7
2-4. Proposition californienne 65 Avertissements 8
2-5. Principales normes de sécurité 9
2-6. Informations relatives aux CEM 9
SECTION 3 – INTRODUCTION 11
3-1. Specifications 11
SECTION 4 – INSTALLATION 11
4-1. Mounting Plate Hole Layout 11
4-2. Installing Insulator Kit 12
4-3. Rear Panel Connections 13
4-4. 9-Pin Network Receptacle RC1 Information 13
4-5. 10-Socket Motor Receptacle RC8 Information 13
4-6. Gun Recommendation Table 14
4-7. AROI Display At Power Up 14
4-8. Input Connections To AROI Receptacle RC100 [(Remote Program Number Select And Remote Start/Stop Select) See Section 4-9 For Additional Information] 14
4-9. Connections To AROI Receptacle RC100 (See Section 4-10 For Additional Information) 15
4-10. Receptacle RC100 Information And Example Connections 16
SECTION 5 – OPERATION 18
5-1. Operational Terms 18
5-2. Power Switch 20
5-3. Front Panel Sections 20
5-4. Program Push Button 21
5-5. Upper Display 21
5-6. Lower Display 22
5-7. Feeder Set Up Push Button 23
5-8. Setting Output Relay A And Outut Relay B 24
5-9. Adjust Knob 25
5-10. Process Set Up Push Button 25
5-11. Jog/Purge 26
SECTION 6 – SETTING SEQUENCE PARAMETERS 27
6-1. Sequence Parameters In A Program 27
SECTION 7 – MAINTENANCE 28
7-1. Routine Maintenance 28
7-2. Diagnostics 29
SECTION 8 – ELECTRICAL DIAGRAM 32
SECTION 9 – PARTS LIST 34
WARRANTY

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

som _2010-03

,

Protect yourself and others from injury — read and follow these precautions.

1-1. Symbol Usage

DANGER! – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

NOTICE *– Indicates statements not related to personal injury.*

☞ *Indicates special instructions.*

This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. Read and follow all Safety Standards.

Only qualified persons should install, operate, maintain, and repair this unit.

During operation, keep everybody, especially children, away.

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists in inverter welding power sources AFTER removal of inputpower.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS can burn eyes and skin.

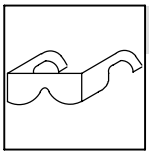
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or by-pass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.



FLYING METAL or DIRT can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

ELECTRIC AND MAGNETIC FIELDS (EMF) can affect ImplantedMedical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

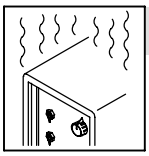
1-3. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

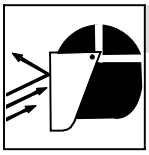
FALLING EQUIPMENT can injure.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.
- Keep equipment (cables and cords) away from moving vehicles when working from an aerial location.
- Follow the guidelines in the Applications Manual for the Revised NIOSH Lifting Equation (Publication No. 94–110) when manually lifting heavy parts or equipment.



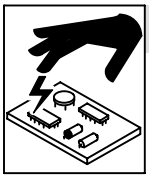
OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



FLYING SPARKS can injure.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

MOVING PARTS can injure.

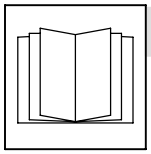
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

WELDING WIRE can injure.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

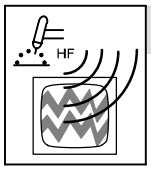
MOVING PARTS can injure.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance and troubleshooting as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.



READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. California Proposition 65 Warnings

Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. *Wash hands after handling.*

This product contains chemicals, including lead, known to the state of California to cause cancer, birth defects, or other reproductive harm. *Wash hands after use.*

For Gasoline Engines:

Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

For Diesel Engines:

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

1-5. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org and www. sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (phone: 703-788-2700, website:www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org.

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 OSHA Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (phone: 301-504-7923, website: www.cpsc.gov).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (phone: 1-800-232-4636, website: www.cdc.gov/NIOSH).

1-6. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). Welding current creates an EMF field around the welding circuit and welding equipment. EMF fields may interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, access restrictions for passers–by or individual risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.

About Implanted Medical Devices:

Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

Se protéger et protéger les autres contre le risque de blessure — lire et respecter ces consignes.

2-1. Symboles utilisés

DANGER! – Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

***NOTE** – Indique des déclarations pas en relation avec des blessures personnelles.*

☞ *Indique des instructions spécifiques.*

Ce groupe de symboles veut dire Avertissement! Attention! DANGER DE CHOC ELECTRIQUE, PIECES EN MOUVEMENT, et PIECES CHAUDES. Consulter les symboles et les instructions ci-dessous y afférant pour les actions nécessaires afin d'éviter le danger.

2-2. Dangers relatifs au soudage à l'arc

Les symboles représentés ci-dessous sont utilisés dans ce manuel pour attirer l'attention et identifier les dangers possibles. En présence de l'un de ces symboles, prendre garde et suivre les instructions afférentes pour éviter tout risque. Les instructions en matière de sécurité indiquées ci-dessous ne constituent qu'un sommaire des instructions de sécurité plus complètes fournies dans les normes de sécurité énumérées dans la Section 2-5. Lire et observer toutes les normes de sécurité.

Seul un personnel qualifié est autorisé à installer, faire fonctionner, entretenir et réparer cet appareil.

Pendant le fonctionnement, maintenir à distance toutes les personnes, notamment les enfants de l'appareil.

UNE DÉCHARGE ÉLECTRIQUE peut entraîner la mort.

Le contact d'organes électriques sous tension peut provoquer des accidents mortels ou des brûlures graves. Le circuit de l'électrode et de la pièce est sous tension lorsque le courant est délivré à la sortie. Le circuit d'alimentation et les circuits internes de la machine sont également sous tension lorsque l'alimentation est sur Marche. Dans le mode de soudage avec du fil, le fil, le dérouleur, le bloc de commande du rouleau et toutes les parties métalliques en contact avec le fil sont sous tension électrique. Un équipement installé ou mis à la terre de manière incorrecte ou impropre constitue un danger.

- Ne pas toucher aux pièces électriques sous tension.
- Porter des gants isolants et des vêtements de protection secs et sans trous.
- S'isoler de la pièce à couper et du sol en utilisant des housses ou des tapis assez grands afin d'éviter tout contact physique avec la pièce à couper ou le sol.
- Ne pas se servir de source électrique à courant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique à courant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique à courant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- D'autres consignes de sécurité sont nécessaires dans les conditions suivantes : risques électriques dans un environnement humide ou si l'on porte des vêtements mouillés ; sur des structures métalliques telles que sols, grilles ou échafaudages ; en position coincée comme assise, à genoux ou couchée ; ou s'il y a un risque élevé de contact inévitable ou accidentel avec la pièce à souder ou le sol. Dans ces conditions, utiliser les équipements suivants, dans l'ordre indiqué : 1) un poste à souder DC à tension constante (à fil), 2) un poste à souder DC manuel (électrode) ou 3) un poste à souder AC à tension à vide réduite. Dans la plupart des situations, l'utilisation d'un poste à souder DC à fil à tension constante est recommandée. En outre, ne pas travailler seul !
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer le poste correctement et le mettre à la terre convenablement selon les consignes du manuel de l'opérateur et les normes nationales, provinciales et locales.
- Toujours vérifier la terre du cordon d'alimentation. Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée, fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Les câbles doivent être exempts d'humidité, d'huile et de graisse; protégez–les contre les étincelles et les pièces métalliques chaudes.
- Vérifier fréquemment le cordon d'alimentation afin de s'assurer qu'il n'est pas altéré ou à nu, le remplacer immédiatement s'il l'est. Un fil à nu peut entraîner la mort.
- L'équipement doit être hors tension lorsqu'il n'est pas utilisé.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- Ne pas toucher des porte électrodes connectés à deux machines en même temps à cause de la présence d'une tension à vide doublée.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité si l'on doit travailler au-dessus du sol.
- S'assurer que tous les panneaux et couvercles sont correctement en place.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.
- Ne pas raccorder plus d'une électrode ou plus d'un câble de masse à une même borne de sortie de soudage.

Il reste une TENSION DC NON NÉGLIGEABLE dans les sources de soudage onduleur UNE FOIS l'alimentation coupée.

- Arrêter les convertisseurs, débrancher le courant électrique et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie Entretien avant de toucher les pièces.

LES PIÈCES CHAUDES peuvent provoquer des brûlures.

- Ne pas toucher à mains nues les parties chaudes.
- Prévoir une période de refroidissement avant de travailler à l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.

LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'intérieur, ventiler la zone et/ou utiliser une ventilation forcée au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre les spécifications de sécurité des matériaux (MSDS) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

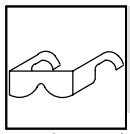
Le rayonnement de l'arc du procédé de soudag génère des rayons visibles et invisibles intense (ultraviolets et infrarouges) susceptibles de provoquer des brûlure dans les yeux et sur la peau. Des étincelles sont projetées pendant l soudage.

- Porter un casque de soudage approuvé muni de verres filtrants approprié pour protéger visage et yeux pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.
- Porter des vêtements confectionnés avec des matières résistantes et ignifuges (cuir, coton lourd ou laine) et des bottes de protection.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Ne soudez pas si l'air ambiant est chargé de particules, gaz, ou vapeurs inflammables (vapeur d'essence, par exemple).
- Brancher le câble de masse sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, d'étincelles et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.
- Une fois le travail achevé, assurez–vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe–circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Une fois le travail achevé, assurez–vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe–circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Suivre les recommandations dans OSHA 1910.252(a)(2)(iv) et NFPA 51B pour les travaux à chaud et avoir de la surveillance et un extincteur à proximité.



DES PIECES DE METAL ou DES SALETES peuvent provoquer des blessures dans les yeux.

- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non-utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

Les CHAMPS ÉLECTROMAGNÉTIQUES (CEM) peuvent affecter les implants médicaux.

- Les porteurs de stimulateurs cardiaques et autres implants médicaux doivent rester à distance.
- Les porteurs d'implants médicaux doivent consulter leur médecin et le fabricant du dispositif avant de s'approcher de la zone où se déroule du soudage à l'arc, du soudage par points, du gougeage, de la découpe plasma ou une opération de chauffage par induction.

LE BRUIT peut endommager l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvées pour les oreilles si le niveau sonore est trop élevé.

LES BOUTEILLES peuvent exploser si elles sont endommagées.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, des dommages physiques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique ; les maintenir ainsi que les éléments associés en bon état.
- Détourner votre visage du détendeur-régulateur lorsque vous ouvrez la soupape de la bouteille.
- Le couvercle du détendeur doit toujours être en place, sauf lorsque la bouteille est utilisée ou qu'elle est reliée pour usage ultérieur.
- Utiliser les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever et déplacer les bouteilles.
- Lire et suivre les instructions sur les bouteilles de gaz comprimé, l'équipement connexe et le dépliant P-1 de la CGA (Compressed Gas Association) mentionné dans les principales normes de sécurité.

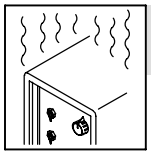
2-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Ne pas installer l'appareil à proximité de produits inflammables.
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionnée et protégée avant de mettre l'appareil en service.

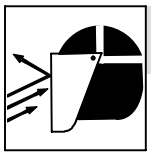
LA CHUTE DE L'ÉQUIPEMENT peut provoquer des blessures.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariots, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.
- Tenir l'équipement (câbles et cordons) à distance des véhicules mobiles lors de toute opération en hauteur.
- Suivre les consignes du Manuel des applications pour l'équation de levage NIOSH révisée (Publication Nº94–110) lors du levage manuelle de pièces ou équipements lourds.



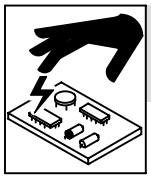
L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement ; respecter le cycle opératoire nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.



LES ÉTINCELLES PROJETÉES peuvent provoquer des blessures.

- Porter un écran facial pour protéger le visage et les yeux.
- Affûter l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette manœuvre est à exécuter dans un endroit sûr lorsque l'on porte l'équipement homologué de protection du visage, des mains et du corps.
- Les étincelles risquent de causer un incendie – éloigner toute substance inflammable.



LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

Les PIÈCES MOBILES peuvent causer des blessures.

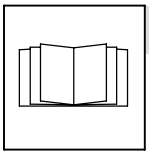
- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gâchette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.

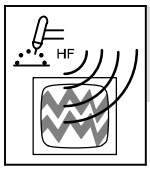
Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des organes mobiles tels que des ventilateurs.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Lorsque cela est nécessaire pour des travaux d'entretien et de dépannage, faire retirer les portes, panneaux, recouvrements ou dispositifs de protection uniquement par du personnel qualifié.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de rebrancher l'alimentation électrique.



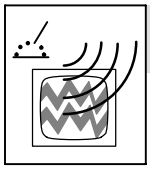
LIRE LES INSTRUCTIONS.

- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- Effectuer l'entretien en respectant les manuels d'utilisation, les normes industrielles et les codes nationaux, d'état et locaux.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute fréquence (H.F.) peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et un blindage pour réduire les interférences éventuelles.



LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

2-4. Proposition californienne 65 Avertissements

⚠ **Les équipements de soudage et de coupage produisent des fumées et des gaz qui contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des malformations congénitales et, dans certains cas, des cancers. (Code de santé et de sécurité de Californie, chapitre 25249.5 et suivants)**

⚠ **Les batteries, les bornes et autres accessoires contiennent du plomb et des composés à base de plomb, produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation. Se laver les mains après manipulation.**

⚠ **Ce produit contient des produits chimiques, notamment du plomb, dont l'État de Californie reconnaît qu'ils provoquent des cancers, des malformations congénitales ou d'autres problèmes de procréation. *Se laver les mains après utilisation.***

Pour les moteurs à essence :

⚠ **Les gaz d'échappement des moteurs contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation.**

Pour les moteurs diesel :

⚠ **Les gaz d'échappement des moteurs diesel et certains de leurs composants sont reconnus par l'État de Californie comme provoquant des cancers et des malformations congénitales ou autres problèmes de procréation.**

2-5. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site Internet : www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site internet : www.global.ihs.com).

National Electrical Code, NFPA Standard 70, de National Fire Protection Association, Quincy, MA 02269 (téléphone : 800-344-3555, site Internet : www.nfpa.org et www.sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (téléphone : 703-788-2700, site Internet : www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, de Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (téléphone : 800-463-6727, site internet : www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, de American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (téléphone : 212-642-4900, site Internet : www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, de National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (téléphone : 617-770-3000, site Internet : www.nfpa.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, de U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (téléphone : 1-866-512-1800) (il y a 10 bureaux régionaux–le téléphone de la région 5, Chicago, est 312-353-2220, site Internet : www.osha.gov).

U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (téléphone : 301-504-7923, site internet : www.cpsc.gov).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (télé[hone : 1-800-232-4636, site internet: www.cdc.gov/NIOSH).

2-6. Informations relatives aux CEM

Le courant électrique qui traverse tout conducteur génère des champs électromagnétiques (CEM) à certains endroits. Le courant de soudage crée un CEM autour du circuit et du matériel de soudage. Les CEM peuvent créer des interférences avec certains implants médicaux comme des stimulateurs cardiaques. Des mesures de protection pour les porteurs d'implants médicaux doivent être prises: par exemple, des restrictions d'accès pour les passants ou une évaluation individuelle des risques pour les soudeurs. Tous les soudeurs doivent appliquer les procédures suivantes pour minimiser l'exposition aux CEM provenant du circuit de soudage:

1. Rassembler les câbles en les torsadant ou en les attachant avec du ruban adhésif ou avec une housse.
2. Ne pas se tenir au milieu des câbles de soudage. Disposer les câbles d'un côté et à distance de l'opérateur.
3. Ne pas courber et ne pas entourer les câbles autour de votre corps.
4. Maintenir la tête et le torse aussi loin que possible du matériel du circuit de soudage.
5. Connecter la pince sur la pièce aussi près que possible de la soudure.
6. Ne pas travailler à proximité d'une source de soudage, ni s'asseoir ou se pencher dessus.
7. Ne pas souder tout en portant la source de soudage ou le dévidoir.

En ce qui concerne les implants médicaux :

Les porteurs d'implants doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de soudage par points, de gougeage, du coupage plasma ou de chauffage par induction. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.

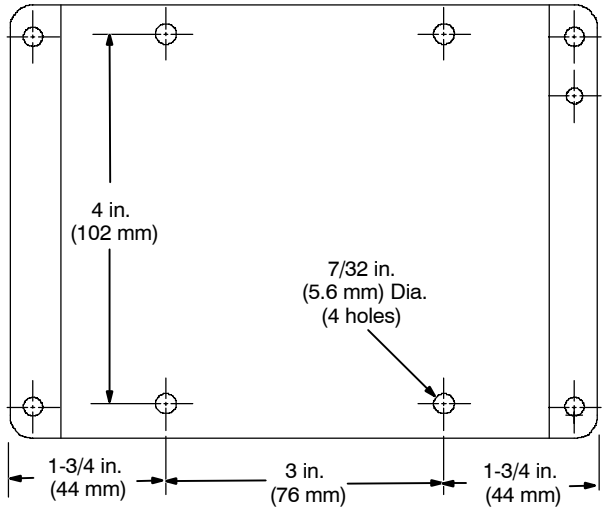
SECTION 3 – INTRODUCTION

3-1. Specifications

Type of Input Power	Welding Power Source Type	Wire Feed Speed Range	Wire Diameter Range	Welding Circuit Rating	Overall Dimensions	Weight
40 Volts DC 10 Amperes	Axcess Series	Standard: 40 To 1400 ipm (1.0 To 35.6 mpm)	.030 To 1/8 in. (0.8 To 3.2 mm) Max Spool Weight: 60 lb (27 kg)	100 Volts, 750 Amperes, 100% Duty Cycle	Length: 7-1/2 in. (191 mm) Width: 7 in. (178 mm) Height: 12-1/2 in. (318 mm)	10 lb (4.5 kg)

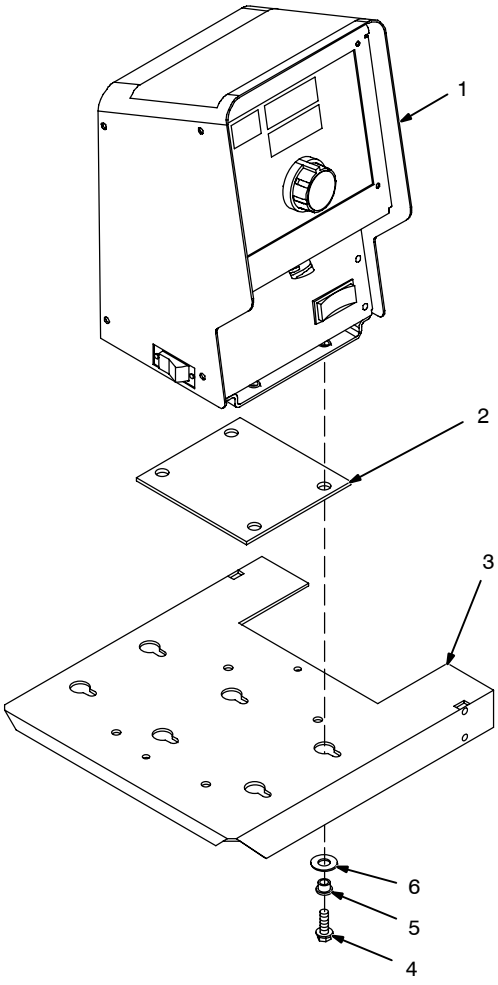
SECTION 4 – INSTALLATION

4-1. Mounting Plate Hole Layout



Ref. 200 553-A

4-2. Installing Insulator Kit



Turn Off and disconnect input power.

1 ROI Control
2 Insulator Plate
3 Mounting Plate
4 1/4-20x3/4 in. Screw (4)
5 Nylon Shoulder Washer (4)
6 3/8 in. Flat Washer (4)

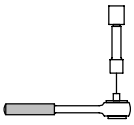
Place insulator plate between ROI base and metal mounting surface.

Place nylon shoulder washer over screw.

Place flat washer over shoulder washer.

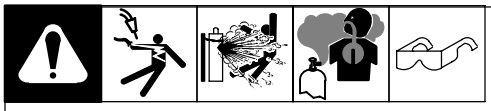
Insert hardware assembly through hole in metal mounting base, insulator, and into ROI base (4 locations). Tighten hardware to secure control.

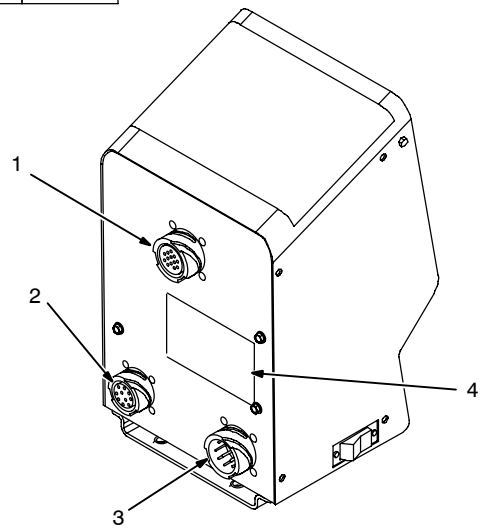
Tools Needed:



804 165-A

4-3. Rear Panel Connections

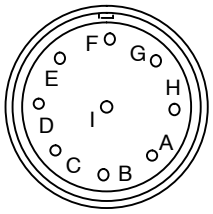




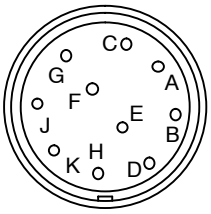
1 Input/Output Receptacle RC100
2 Motor Control/Shielding Gas Valve Receptacle RC8
3 9-Pin Network Receptacle RC1
4 Rating Label Location

804 091-A

4-4. 9-Pin Network Receptacle RC1 Information

REMOTE 9	Pin	Pin Information
	A	Capacitor C1 to ground
	B	Shield
	C	Volt sense
	D	Can low
	E	Can high
	F	+24 volts DC common
	G	+ 24 volts DC
	H	Motor voltage –40 volts
	I	Motor voltage +40 volts

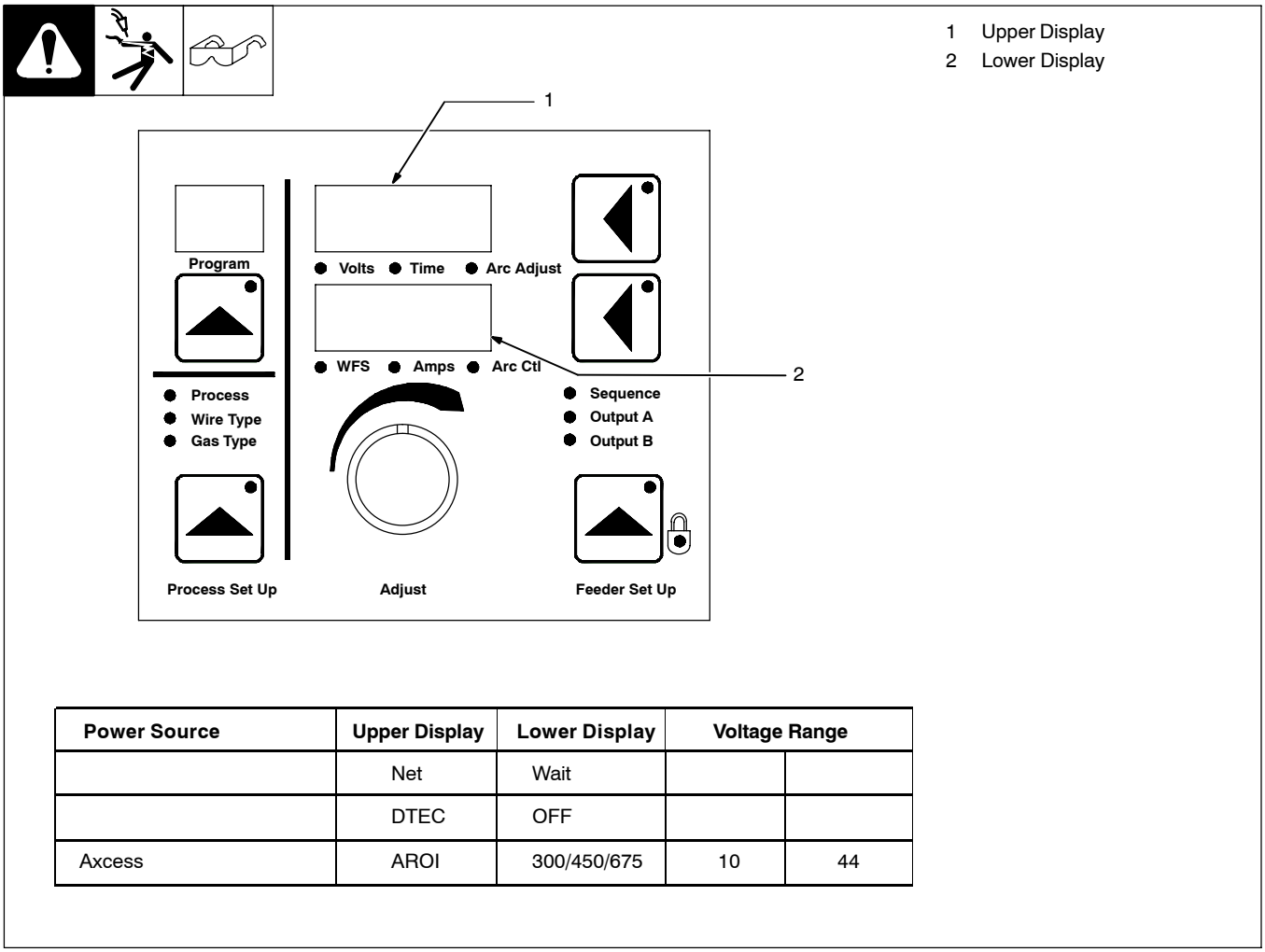
4-5. 10-Socket Motor Receptacle RC8 Information

	Socket	Socket Information
	A	Not used
	B	Motor common
	C	+1.75 volts DC ±0.2 volts when tach A encoder is rotating
	D	+1 volt DC per 35 IPM with respect to pin B
	E	Tach common
	F	Gas valve common
	G	Electrode sense
	H	+5 volts DC tach
	J	+40 volts DC gas valve

4-6. Gun Recommendation Table

Process	Gun
GMAW – Hard or Cored Wires	400, 500, And 600 Amp Air-Cooled Guns
GMAW – Pulse	Water-Cooled Guns

4-7. AROI Display At Power Up



Power Source	Upper Display	Lower Display	Voltage Range	
	Net	Wait		
	DTEC	OFF		
Axcess	AROI	300/450/675	10	44

4-8. Input Connections To AROI Receptacle RC100 [(Remote Program Number Select And Remote Start/Stop Select) See Section 4-9 For Additional Information]

Receptacle RC100		Prog. 1	Prog 2	Prog. 3	Prog. 4	Prog. 5	Prog. 6	Prog. 7	Prog. 8
L	Input Common								
C	Contactor On								
B	Program Select Input C					X	X	X	X
F	Program Select Input B			X	X			X	X
M	Program Select Input A		X		X		X		X

X = Input terminal activated (shorted to RC100 L. When inputs to RC100 M, F, and B are activated, Program 8 is selected. If no program select input is activated, Program 1 is selected.

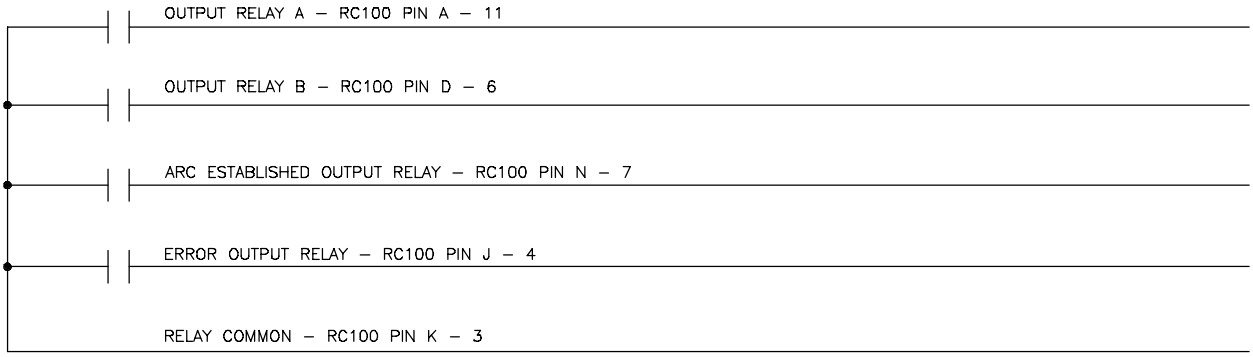
4-9. Connections To AROI Receptacle RC100 (See Section 4-10 For Additional Information)

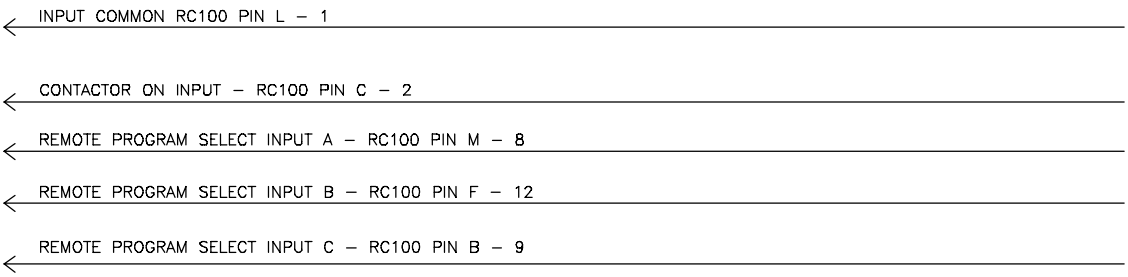
RC100 Pin	I/O Cable Lead Number	Connection
A	11	Output A normally-open
B	9	Program select input C
C	2	Contactor On input
D	6	Output B normally-open
E	None	No connection
F	12	Program select input B
G	None	No connection
H	None	No connection
J	4	Error output normally-open
K	3	Relay common
L	1	Input common
M	8	Program select input A
N	7	Arc established output normally-open

4-10. Receptacle RC100 Information And Example Connections

⚠ WARNING	• Do not touch live electrical parts. • Disconnect input power or stop engine before servicing. • Do not operate with covers removed. • Have only qualified persons install, use, or service this unit.
ELECTRIC SHOCK HAZARD	

NOTE RELAY CONTACT RATING: 2 AMP, 28 VDC, RESISTIVE
0.6 AMP, 120 VAC, RESISTIVE


OUTPUT RELAY A – RC100 PIN A – 11
OUTPUT RELAY B – RC100 PIN D – 6
ARC ESTABLISHED OUTPUT RELAY – RC100 PIN N – 7
ERROR OUTPUT RELAY – RC100 PIN J – 4
RELAY COMMON – RC100 PIN K – 3

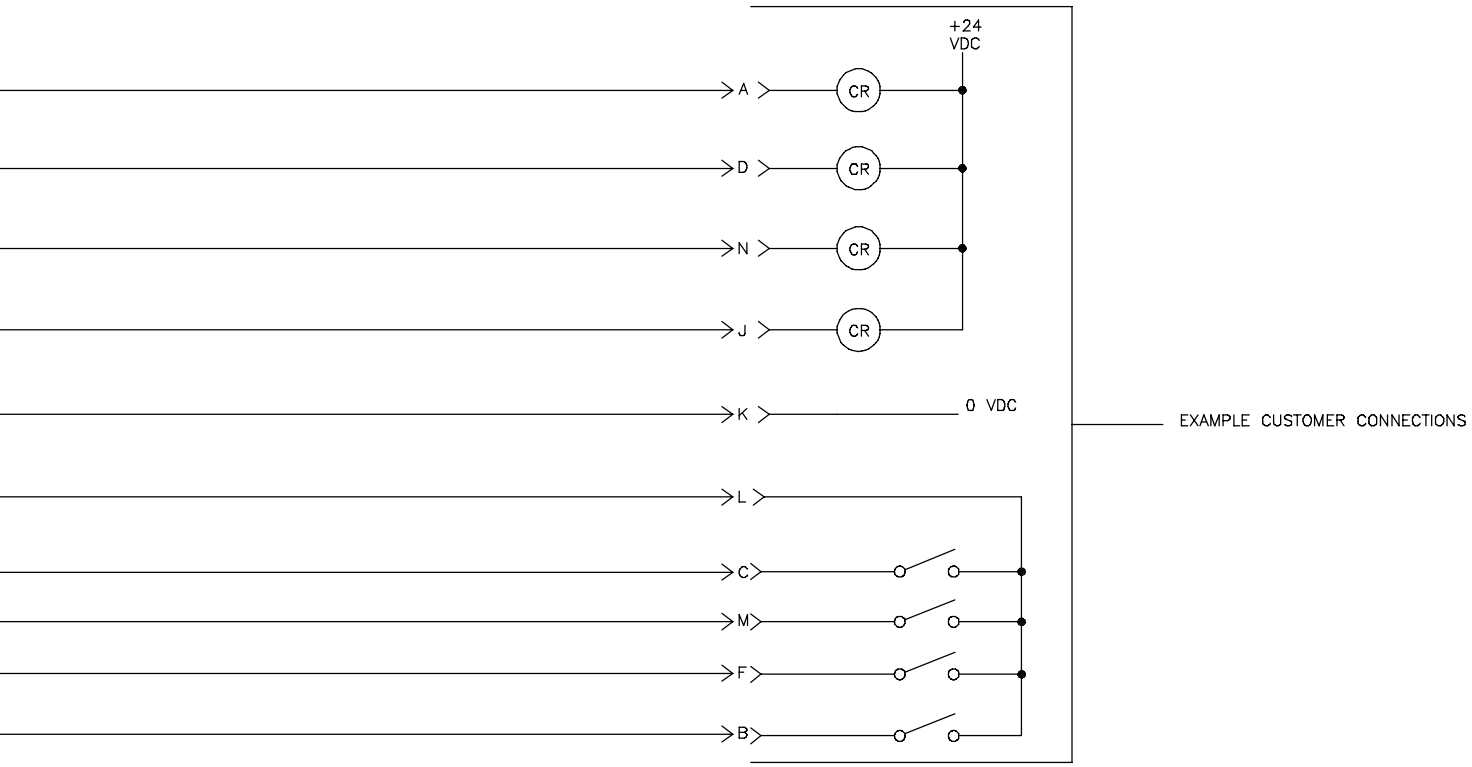

INPUT COMMON RC100 PIN L – 1
CONTACTOR ON INPUT – RC100 PIN C – 2
REMOTE PROGRAM SELECT INPUT A – RC100 PIN M – 8
REMOTE PROGRAM SELECT INPUT B – RC100 PIN F – 12
REMOTE PROGRAM SELECT INPUT C – RC100 PIN B – 9

NOTE NUMBERS CALLED OUT ABOVE CORRESPOND TO LEAD COLORS ON SUPPLIED MATING CABLE

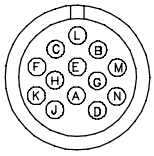
REMOTE PROGRAM SELECT INPUT BITS

PROGRAM #	RPS A	RPS B	RPS C
1			
2	X		
3		X	
4	X	X	
5			X
6	X		X
7		X	X
8	X	X	X

NOTE REMOTE PROGRAM SELECT INPUTS ARE ONLY ACTIVE AFTER THE CONTACTOR IS TURNED "ON"



RC100



NOTE VIEW OF RC100 IS OF SUPPLIED CABLE END THAT MATES TO AROI BACK PANEL

227 983-B

SECTION 5 – OPERATION

5-1. Operational Terms

The following is a list of terms and their definitions as they apply to the interface unit in the wire feeder:

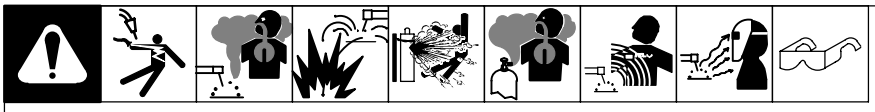
General Terms:

Adaptive Pulse Welding	When the “adaptive pulse” welding process is selected, the unit will attempt to automatically regulate weld output in order to maintain a constant arc length, regardless of change in welding wire stickout.
Abk (Background Amperage)	Abk is the low weld current. Background current preheats welding wire and maintains the arc. When background current is too low, the arc is unstable and hard to maintain.
Apk (Peak Amperage)	Apk is the high pulse of welding current. Peak current melts the welding wire and forms a droplet. The droplet is forced into the weld puddle.
Vpk (Peak Voltage)	Arc voltage during peak current phase of the pulse waveform. This determines arc length during adaptive pulse welding.
Inductance	In short circuit GMAW welding, an increase in inductance will decrease the number of short circuit metal transfers per second (provided no other changes are made) and increase the arc-on time. The increased arc-on time makes the pool more fluid.
PPS (Pulses Per Second)	PPS, pulse rate, and frequency (Hz) are used interchangeably. A PPS or pulse rate of 60 Hz means 60 pulses of current are produced each second.
PWms (Pulse Width in Milliseconds)	PWms is the time spent at peak current (1.2 ms is .0012 seconds). This time must be long enough to form a droplet of welding wire. The stiffness or fluidity of the molten weld puddle is controlled by PWms.
Synergic	Synergic refers to the unit’s ability to use preprogrammed pulse parameters to determine the actual pulse settings of Peak Amperage, Background Amperage, Pulse Frequency and Pulse Width at any specific wire feed speed setting.
Arc Adjust	Term used to represent arc length adjustments in pulse programs. Increasing Arc Adjust increases the actual arc length. Likewise, decreasing arc adjust shortens arc length. Arc Adjust is replaced by volts in MIG programs.
Program	Eight active slots for selection of various processes, wire type, and parameters.
Process	A selection made for MIG, Pulse, Accu-pulse, and RMD (optional).
MIG	CV weld process with individual settings of voltage and wire speed.
Pulse	Conventional pulse program using peak, background, pulse width, frequency, and peak voltage as factory taught data. Adaptive method is controlled by frequency adjustment.
Accu-pulse	Pulse process utilizing constant current ramps with constant voltage control of peaks and backgrounds. Adaptive response is controlled by peak and minimum current levels. Benefits are shorter arc lengths, better puddle control, more tolerant of tip-to-work variation, less audible noise, no arc wandering, allows weld to fill in at toes increasing travel speed and deposition, and more tolerant to poor fit up and gaps.
Accuspeed (Optional)	CV Pulse process designed for high travel speeds. Typically used in Robotic applications. Arc is designed to be tight and fast. Front panel display is ACCU – SPED.
AccuCurve	CV Pulse process using a pulse waveform with modified curves at particular locations within the waveform. Has a distinguished change in arc characteristics. Front panel display is ACCU – CURV.
RMD (optional)	RMD refers to Regulated Metal Deposition. A precisely controlled short-circuit transfer. Benefits of RMD are well suited to thin materials, improves gap filling and spatter reduction. Provides less heat input into workpiece, minimizes distortion and allows use of larger diameter wire on thin gauge materials.
Wire Type	Selection of wire type by alloys and classification.
Gase Type	Selection of shielding gas being used in application.
Process Set Up	Selection procedure for entering program.
Program Load	Enters selected program information into program slot.
Volts	Preset voltage in MIG mode at idle, actual voltage while welding, and 3 seconds hold value at end of weld.
Time	Indicates time values being set for timed functions (e.g. Preflow, Postflow which are only available in the Arc On and Analog input or the Arc On and No Analog input modes).
Arc Length	Distance from end of wire electrode to workpiece.
WFS	Term used to represent wire feed speed. In MIG mode, wire feed setting is independent of voltage setting. In pulse, Accu-pulse, and RMD (optional) adjusting wire feed speed also increases power level on wire electrode (one knob control).
Amps	Indicates average amperage while welding and 3 seconds hold value at end of weld.

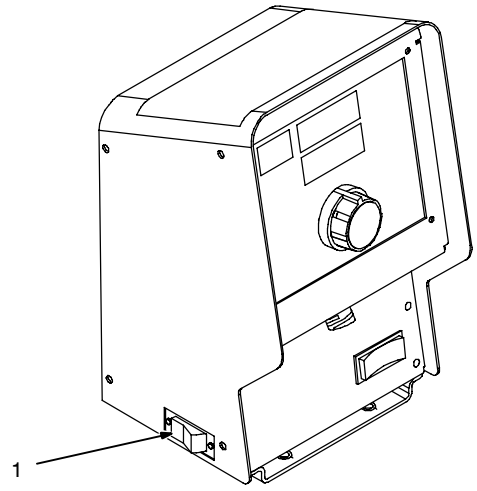
General Terms:

Arc Control	Pressing this button will allow setting of inductance in MIG mode and arc control in pulse, Accu-pulse, and RMD (optional). In pulse and Accu-pulse mode this adjustment changes the arc cone by adjusting the preprogrammed factory pulse data. In RMD (optional) this control will affect the arc in much the same way as inductance.
Inductance	In short circuit GMAW welding, an increase in inductance will decrease the number of short circuit transfers per second (provided no other changes are made) and increase the arc-on time. The increased arc-on time makes the welding puddle more fluid.
Adjust	Control knob used to change or set parameters and functions.
Sequence	Selecting Sequence will allow setting of preflow, start, crater, and postflow times and parameters (only available on Auto Axcess models in the Arc On and Analog input or the Arc On and No Analog input modes).
Preflow	Setting a time value for gas flow prior to arc start (only available on Auto Axcess models in the Arc On and Analog input or the Arc On and No Analog input modes, and can only be set with the optional PDA with File Management software).
Start	Provides voltage/arc adjust, wire feed rate, and time value for modified arc starts (only available on Auto Axcess models in the Arc On and Analog input or the Arc On and No Analog input modes, and can only be set with the optional PDA with File Management software).
Weld	Sequence function that allows for a timed weld operation [(0 to 999 seconds) only available on Auto Axcess models in the Arc On and Analog input or the Arc On and No Analog input modes, and can only be set with the optional PDA with File Management software].
Crater	Allows setting of voltage/arc adjust, wire feed rate, and time value for arc ends (only available on Auto Axcess models in the Arc On and Analog input or the Arc On and No Analog input modes, and can only be set with the optional PDA with File Management software).
Postflow	Setting a time value for gas flow after arc end (only available on Auto Axcess models in the Arc On and Analog input or the Arc On and No Analog input modes, and can only be set with the optional PDA with File Management software).
Retract	Sequence function that allows the wire to move back towards the contact tip when a welding operation is completed. Setting is both speed (IPM) and time (sec), (only available on Auto Axcess models in the Arc On and Analog input or the Arc On and No Analog input modes, and can only be set with the optional PDA with File Management software).
Feeder Set Up	Allow selection of Sequence functions.
Auto Thread	Method of jogging wire without holding jog or trigger switch. Pressing Jog and Retract simultaneously will automatically feed wire. Default setting is 192 at a feed rate of 700 ipm (these values can be changed using a PDA with File Management software). Pressing jog, purge, or trigger switch will terminate the auto-threading feature.
Output A Relay and Output B Relay	Normally open, programmable output relays that allow the user to select when these relays turn on or off during a weld sequence.
Arc Established Relay	Normally open relay that energizes when an arc is established.
Error Output Relay	Normally open relay that energizes when an error condition occurs.
Contactor Input	When this is input is shorted to input common, machine output turns on. When this input is open, machine output is off.
Remote Program Select A, Remote Program Select B, and Remote Program Select C	These inputs provide remote control of weld program selection when these inputs are shorted to input common. The remote program selection feature is on by default, to turn this feature off see Section 5-5.

5-2. Power Switch

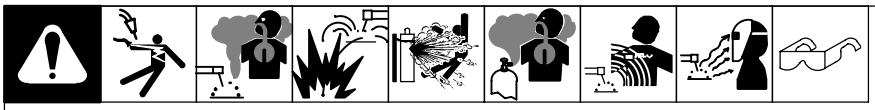


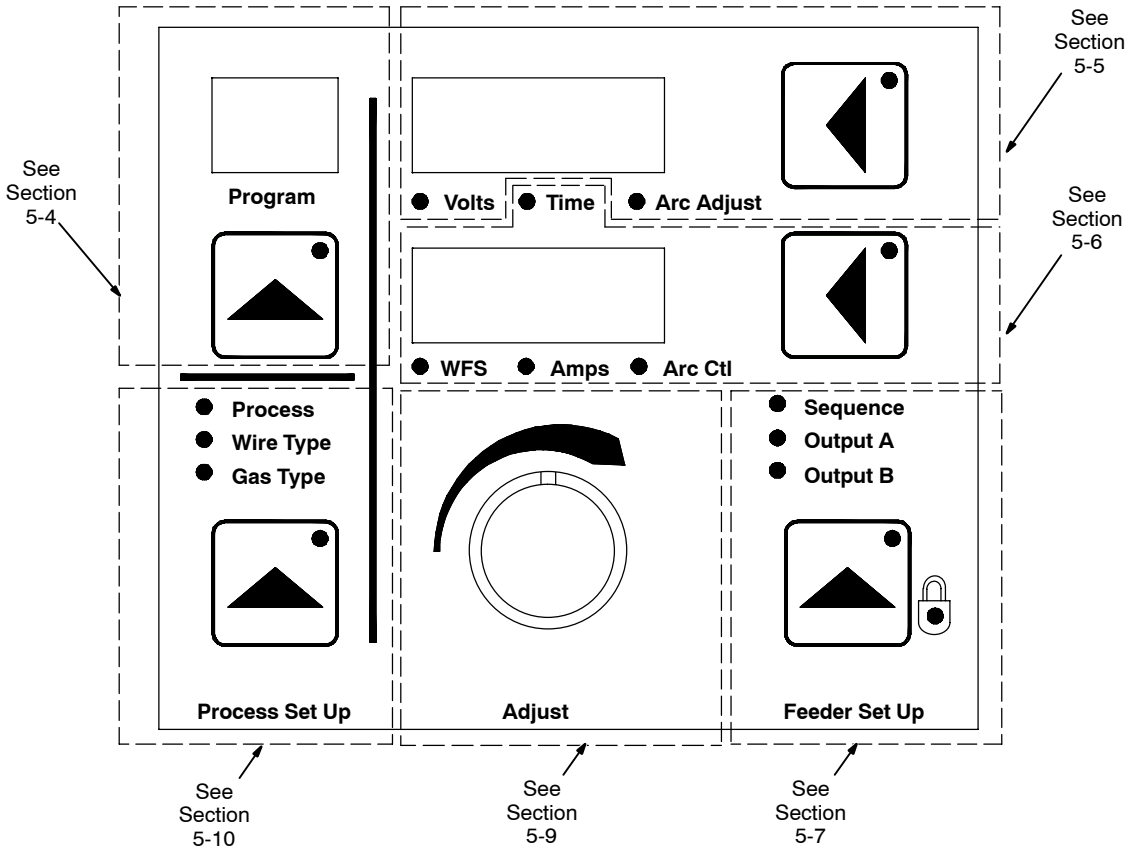
1 Power Switch



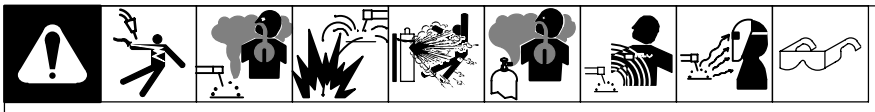
803 694-A

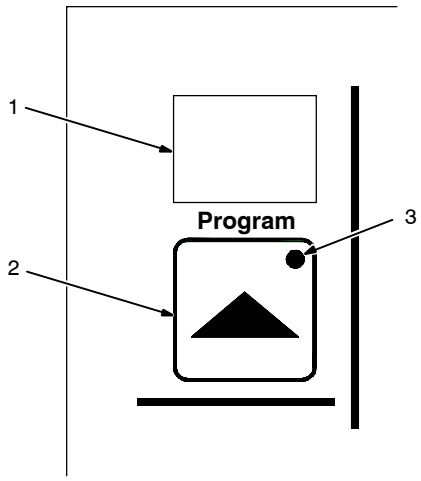
5-3. Front Panel Sections





5-4. Program Push Button





1 Program Display

The number of the active program is displayed.

2 Program Push Button

3 Program Push Button LED

The LED lights to indicate that programs can be changed using the Adjust knob.

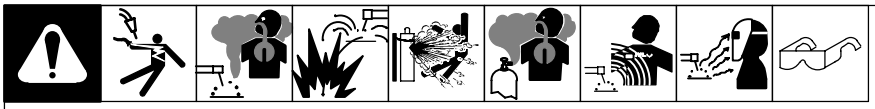
Momentarily press button to illuminate LED. To change the program number, rotate Adjust knob to select one of eight programs.

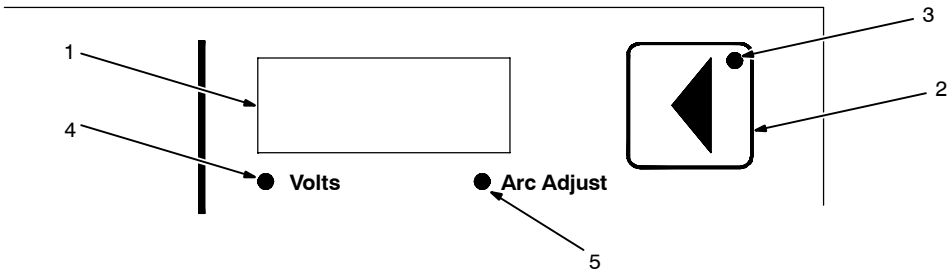
Pressing and holding the push button will display program wire size, wire type and process.

☞ *Reset will not activate if Locks are enabled.*

To reset feeder to factory settings, turn power source off for 10 seconds. Press and hold button in on power up, wait until top display shows RST and bottom display shows NO before releasing button. Feeder Set Up button LED will begin flashing. Turn Adjust knob to change bottom display to show YES, then press Feeder Set Up button to confirm selection. The top display will show CYCL and the lower display will show PWR. Turn welding power source power off for 10 seconds, then turn power back on again.

5-5. Upper Display





1 Upper Display

The upper display at idle (not welding) shows preset volts with process selection MIG or Arc Adjust for all other processes. When welding, the display shows actual voltage. The display will show actual voltage for approximately 3 seconds after welding stops before returning to preset value.

2 Upper Display Push Button

Press the button to illuminate the LED and allow changing information in the display.

3 Upper Display Push Button LED

☞ *Holding the Upper Display Push Button in during power up allows enabling and disabling remote program select. Use the Adjust knob to change the remote program select setting. Press the Feeder Set Up push button to allow the unit to continue its power up procedure.*

The upper display push button LED illuminates to indicate that information displayed can be changed by the Adjust knob.

4 Volts LED

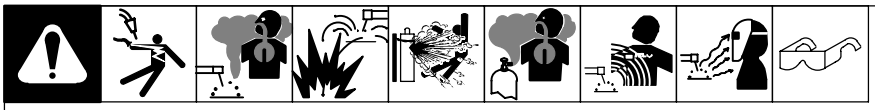
Indicates a voltage value is being displayed, preset voltage in MIG when not welding and actual voltage while welding.

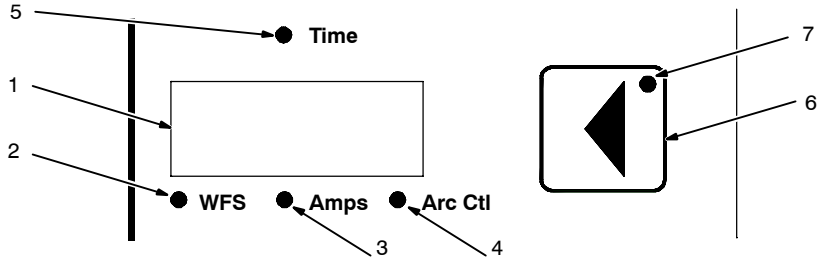
5 Arc Adjust LED

Indicates that displayed value is an arc length value when the process is Pulse, Accu-pulse, or RMD (optional).

☞ *At any time while welding, the display allows adjustment of the weld voltage or arc adjust preset values by turning the Adjust knob. The preset values will be displayed while the knob is being rotated and return to displaying actual values when adjustment is completed.*

5-6. Lower Display





1 Lower Display

The lower display shows WFS (wire feed speed), AMPS (amperage), ARC CTL (arc control), or Time. The feeder displays only preset wire speed at idle (not welding). While welding, the average amperage is displayed. The lower display shows welding sequence time when the Time LED is illuminated.

2 WFS (Wire Feed Speed) LED

LED illuminates to indicate the preset wire feed value is being displayed and can be adjusted using the Adjust knob.

3 Amps LED

LED illuminates to indicate the average amperage is being displayed while welding and for 3 seconds after welding is terminated. The amperage must be above a minimum value of 25 amps for this function to operate.

4 Arc Ctl (Arc Control) LED

LED illuminates to indicate that inductance (MIG) or arc control [Pulse, Accu-pulse, or RMD (optional)] is being displayed and can be adjusted using the Adjust knob.

5 Time LED

LED illuminates to indicate that a time value is being displayed for a sequence function and can be adjusted using the Adjust knob.

6 Lower Display Push Button

7 Lower Display Push Button LED

Pressing the button illuminates the LED and selects either WFS or Arc Ctl value for changing using the Adjust knob.

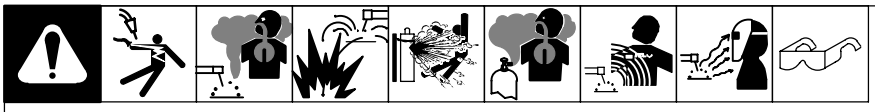
To select Arc Ctl, press and hold lower display button for 2 seconds. The top display will show either INDU for a MIG program or ARC for Pulse, Accu-pulse, or RMD (optional). To exit Arc Ctl or INDU, either press the upper display push button or press and hold the lower display push button for 2 seconds.

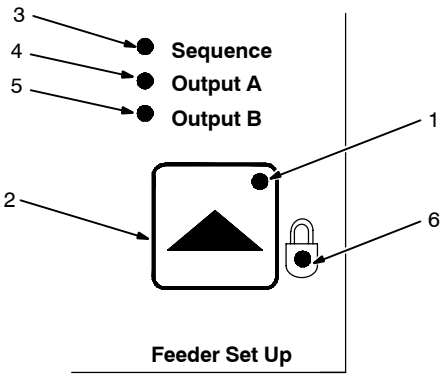
When the lower display push-button LED and the WFS LED are both illuminated, it is possible to to change WFS while welding by using the Adjust knob. The value in the display will switch momentarily to show preset wire feed speed while turning the Adjust knob and revert back to actual value when adjustment is completed.

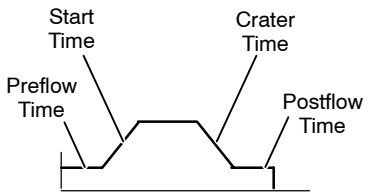
When the Arc Ctl LED is illuminated, it is possible to change values while welding by using the Adjust knob. To return to actual values on the display, exit the Arc Ctl display.

☞ *The lower display push button has additional functions when entering the sequence functions (see Section 5-7).*

5-7. Feeder Set Up Push Button







Sequence Diagram

1 Feeder Set Up Push Button LED

2 Feeder Set Up Push Button

- Press button to choose Sequence. Feeder Set Up push-button LED will illuminate.

3 Sequence LED

- When the Feeder Set Up button is pressed once, the Sequence LED will illuminate and the upper display will show sequence options. Use the Adjust knob to select PRE (preflow), STRT (start), WELD (weld, this sequence can be untimed or timed from 0 to 999 seconds), CRTR (crater), POST (postflow), or RETR (retract).
- Press the lower display push button and the Lower Display push-button LED will illuminate as well as the lower display. The Time LED will automatically begin flashing indicating that a time value can be entered by turning the Adjust knob. By entering a time value the sequence state will become active. To turn off a sequence state, change the time value to OFF. To step back for selecting another sequence option, press the Upper Display push button.
- The Sequence option STRT and CRTR will have additional parameter settings. By pushing the Lower Display push button a second time, while STRT or CRTR appear in the upper display, allows entering voltage (MIG) or Arc Adjust [Pulse, Accu-pulse, or RMD (optional)]. Use the Adjust knob to change the values indicated by the flashing LED for either Volts or Arc Adjust. Pressing the Lower Display push button a third time will activate the WFS setting for either STRT or CRTR and the WFS LED will begin flashing. Use the Adjust knob to change the WFS value.
- Pressing the Feeder Set Up button two more times will exit the Sequence menu and return the system to standby mode.

4 Output A

- When Output A is selected, this LED will illuminate.

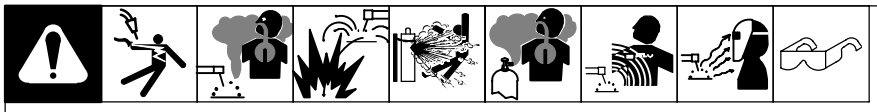
5 Output B

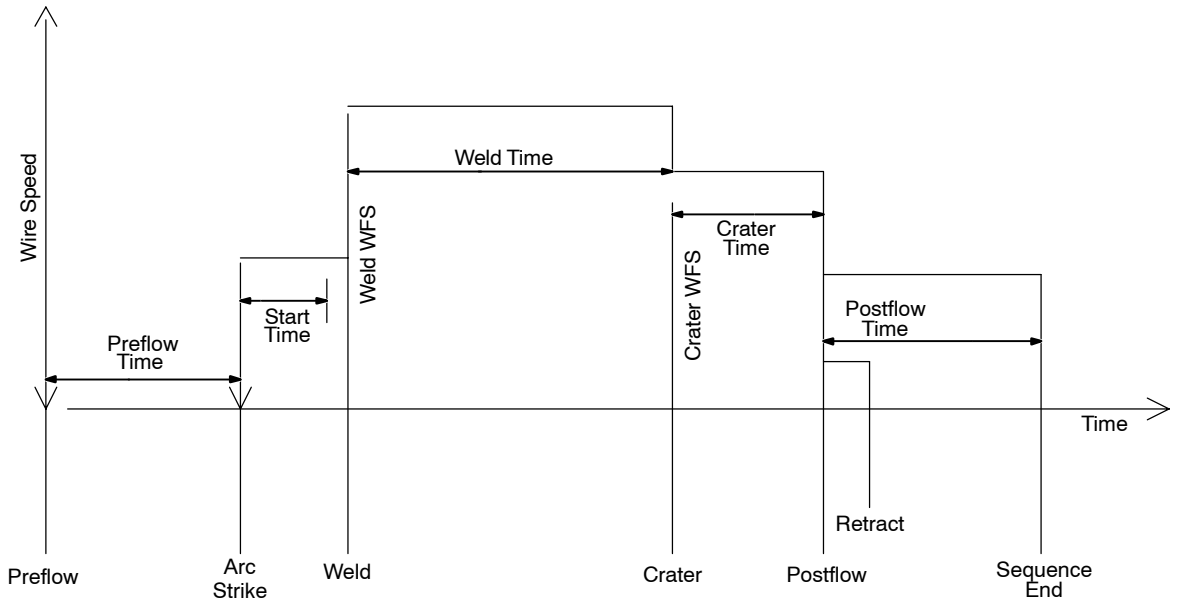
- When Output B is selected, this LED will illuminate.

6 Lock LED

- The lock LED is illuminated when one or more programs have been locked using an optional PDA with File Management/WaveWriter software. This indicates that some programs have been disabled. A disabled program will not show up for selection.
  Refer to the File Management/WaveWriter Owner's Manual for additional information.

5-8. Setting Output Relay A And Outut Relay B

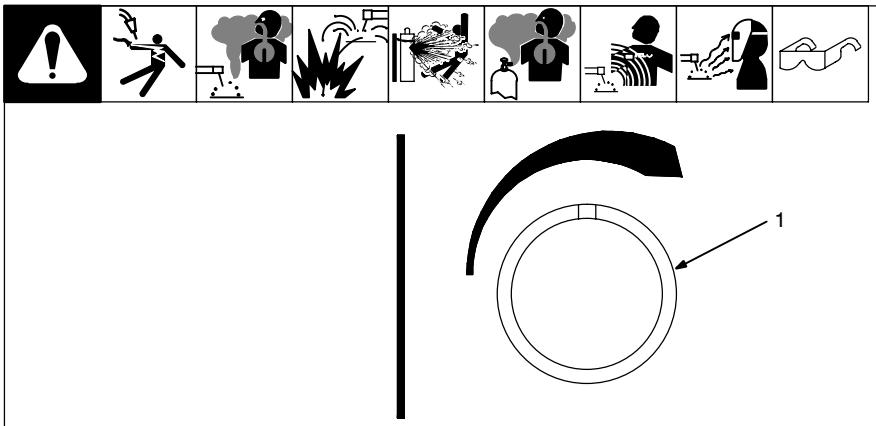




Sequence Diagram

- When the Feeder Set Up button is pressed once, the Sequence LED will illuminate and the upper display will show sequence options. See Section 5-7 for set up procedures.
- Pressing the Feeder Set Up button a second time will display Output A option, and the Lower Display push-button LED will illuminate. Rotate the Adjust knob to turn Output A option on or off. When Output A is on the Output A LED will illuminate.
- If Output A option is turned on, the upper display LED will begin flashing. Pressing the Upper Display button allows selecting on/off sequences in the weld program. Rotate the Adjust knob to cycle through the sequences. The sequences are set up in a weld program as follows:
  Arcstrike (ARC) and Sequence End are not time dependent and are always present in a weld program.
  Weld (WELD) may or may not be time dependent, but it is always present in a weld program.
  Preflow (PRE), startpower (STRT), crater (CRTR), and postflow (POST) are time dependent and may or may not be present in a weld program.
  If a sequence was not enabled by setting a time value while in the sequence option (see Section 5-7), the sequence will appear as DISA (disabled). When a sequence is disabled, the output relay cannot be set.
- Pressing the Lower Display push button allows setting a sequence on or off. if no change is desired, dashes (----) must be selected. Pressing the Upper Display push button or the Feeder Set Up button confirms choices.
  Pressing the Feeder Set Up button again will display Output B option. To set Output B, follow the same procedure listed previously for Output A.
- Pressing the Feeder Set Up button again will exit the Sequence menu and return the system to standby mode.

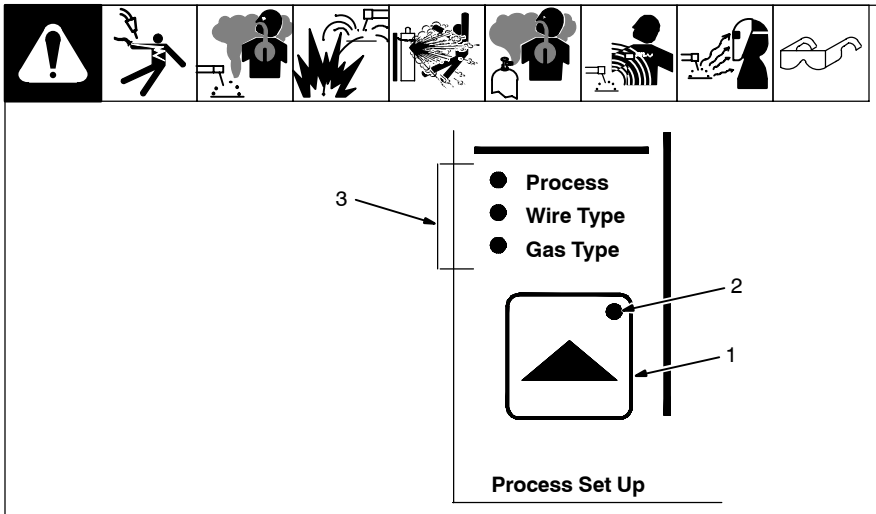
5-9. Adjust Knob



1 Adjust Knob

The Adjust knob is used to change functions and parameters. Refer to the front panel sections for information regarding use of this control.

5-10. Process Set Up Push Button



1 Process Set Up Push Button
2 Process Set Up LED
3 Program Selection LEDs

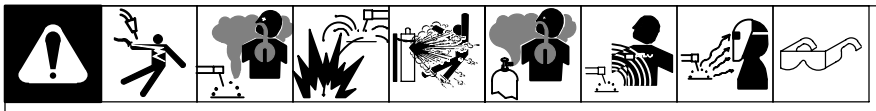
☞ *Holding the Process Set Up push button in during power up will display the software versions of each circuit board. Turn the Adjust knob to cycle through all three circuit boards to view each software revision. Press the Feeder Set Up push butoon to allow the unit to continue its power up procedure.*

- Press the Process Set Up push button the first time will illuminate the button LED and the Process LED. The upper and lower displays will be used for Accu-pulse and only the lower display for MIG, Pulse and RMD (optional) to show the current process intalled in this program. To change process, turn the adjust knob.
- Pressing the Process Set Up push button a second time will illuminate the Wire Type LED and the lower display will show wire types available for selected processes (see Table 5-1 for wire abbreviation). To make a selection, turn the Adjust knob.
- Pressing the Process Set Up push button a third time will keep Wire Type LED lit and the upper display will show wire alloy type (see Table 5-1 for alloy types). The upper display push-button LED will be flashing indicating that turning the Adjust knob will change the alloy type for the selected process and wire type.
- Pressing the Process Set Up push button a fourth time will keep Wire Type LED lit and the upper display will show wire size. The upper display push button will be flashing indicating that turning the Adjust knob will select wire sizes available for that particular process and wire type.
- Pressing the Process Set Up push button a fifth time will illuminate the Gas Type LED and the lower display will show GAS and the upper display will show gas selection (see Table 5-1 for gas abbreviations). To make a gas type selection, turn the Adjust knob.
- If any of the Process, wire type, alloy type, wire size, or gas type was changed, then pressing the Process Set Up push button a sixth time will show PROG in the upper display and LOAD in the lower display. The new program would be loaded for that particular program in slot 1 thru 8. If no changes were made to any setup items, no program will be loaded, and unit will return to standby mode.
- If a custom program is loaded using an optional PDA with File Management software, the Program Display will have a “C” in front of the program number. This indicates that the program is not a factory default program and has been modified. By selecting or changing any process variable and performing a program load will restore the program back to the factory default program.

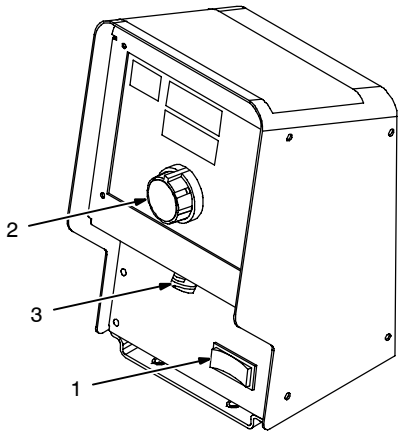
Table 5-1. Welding Wire And Gas Abbreviations*

Wire Description	Wire Abbreviation	Alloy Type	Gas Type	Gas Abbreviation
Steel	STL	E70, E100, E120	100% CO_2, 90% Argon/10% CO_2, 85% Argon/15% CO_2, 75% Argon/25% CO_2, 95% Argon/5% CO_2, 95% Argon /5% O_2, 98% Argon/2% O_2	CO2 C10 C15 C25 C5 OX5 OX2
Stainless Steel	SS	308, 309, 312, 316	98% Argon, 2% O_2 (81Ar/18HE/1CO_2 Accu-pulse) 90HE/7-1/2Ar/2-1/2CO_2 MIG/RMD/Accu-pulse)	OX2 Tri Gas Tri Gas
Cored Tubular Wire	MCOR	71, 76, 86R, 409, 439	90% Argon/10% CO_2	C10
			98% Argon/2% O_2	OX2
Aluminum	ALUM	4XXX, 5XXX	100% Argon	ARGN
* Not all wire types may be available with your unit.				

5-11. Jog/Purge



1 Jog/Purge Push Button
2 Adjust Control
3 Gun Trigger Receptacle



803 693-A

The Jog/Purge switch provides the following functions:

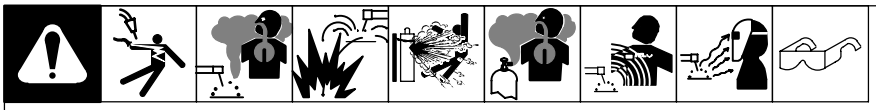
- Pressing left side of the Jog/Purge switch allows the operator to feed wire without energizing the weld power or gas valve circuit. The wire will feed at a 50 ipm rate for 3 seconds, then the rate ramps up to 700 ipm until the Jog switch is released.

☞ *"ERR STRT" will occur after the first 3 seconds of run in without starting an arc preventing wire jog when using the gun trigger. To use the gun trigger to jog wire, the Start Error time must be increased using an optional PDA with File Management software.*

- The unit also provides the ability to jog the wire feeder by means of the gun trigger. When the gun trigger is pressed without starting an arc, the wire will feed at run-in speed for the first 3 seconds. During this time OCV (open circuit voltage) will be present as indicated on feeder upper display. After 3 seconds the weld output turns off and the wire will feed at 50 ipm for the next 3 seconds and then ramps up to 700 ipm until trigger is released or 30 seconds elapses. If the gun trigger is still activated after 30 seconds, the jog operation is terminated to prevent complete unspooling of the wire and an "ERR STRT" message is displayed on the upper and lower displays. Releasing and pressing the trigger again will clear the error.
- Pressing right side of the Jog/Purge switch allows the operator to purge gas lines before welding and to preset gas pressure at the regulator.
- This unit is equipped with Auto Thread capability. By rocking the switch from purge to jog within 0.5 seconds will automatically feed wire for a factory default setting of 192 in (4877 mm) of wire before stopping. The default feed rate is 700 ipm. These settings can be changed using an optional PDA with File Management software.

SECTION 6 – SETTING SEQUENCE PARAMETERS

6-1. Sequence Parameters In A Program



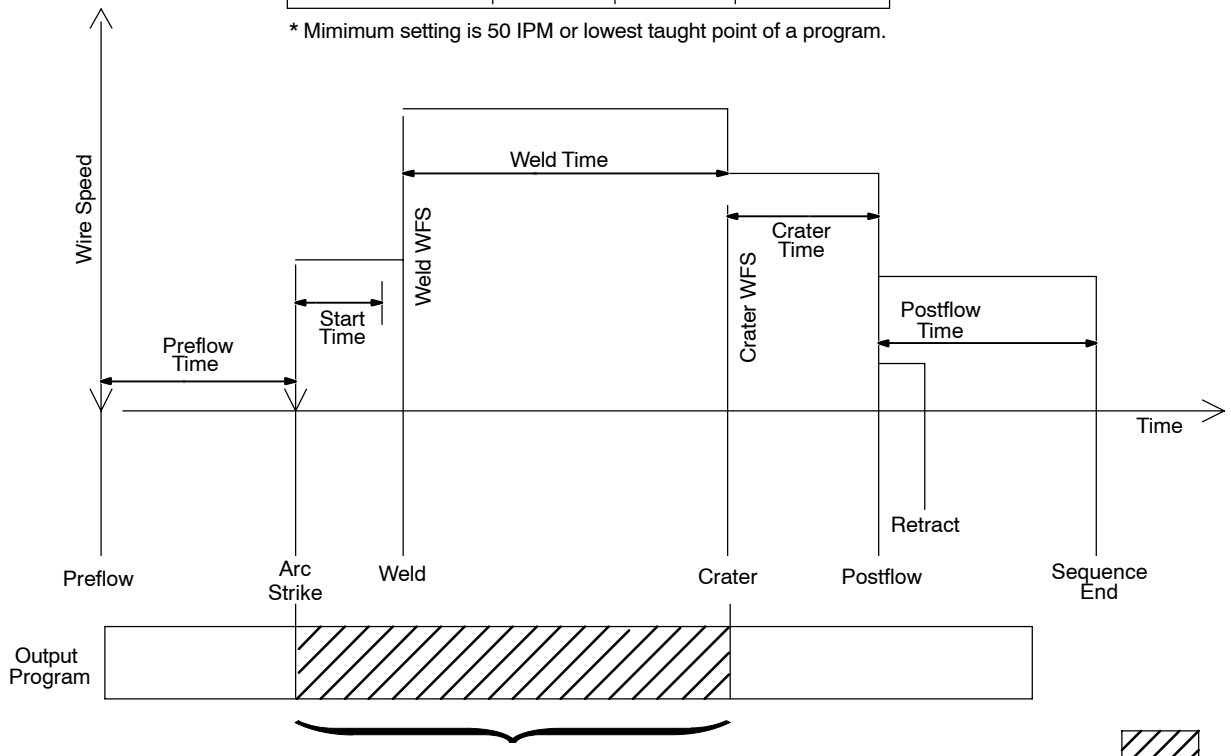
☞ *For more information on Sequence mode, see Feeder Set Up Push Button in Section 5-7.*

If time is set to zero in any timed sequence, the sequence is skipped.

☞ *Maximum IPM may actually be lower depending on the process and wire type selection.*

Sequence	Parameters		
	Volts/Arc Adjust	IPM	Seconds
1. Preflow	— —	— —	Off-10.0
2. Postflow	— —	— —	Off-10.0
3. Start	10.0-44.0/ 0-99	50-1400*/ 0-99	Off-5.0
4. Crater	10.0-44.0/ 0-99	50-1400*/ 0-99	Off-5.0
5. Weld	— —	— —	Infinite-999.9
5. Retract	— —	50-1400*	Off-1.0

* Mimimum setting is 50 IPM or lowest taught point of a program.



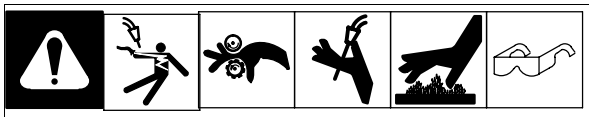
Example: output relay A and B can be set to turn On at arc strike and Off at crater.

Relay Energized

Relay Not Energized

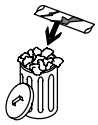
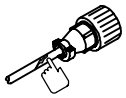
SECTION 7 – MAINTENANCE

7-1. Routine Maintenance



Disconnect power before maintaining.

☞ *Maintain more often during severe conditions.*

	✓ = Check ◇ = Change ◒ = Clean ☆ = Replace * To be done by Factory Authorized Service Agent				Reference
Every **3** Months	 ☆ Unreadable Labels	 ✓☆ Cracked Parts	 ✓☆ Cords		
Every **6** Months	 ◒ Inside Unit				

7-2. Diagnostics

The following error messages are shown on the upper and lower displays to indicate specific errors. Explanations are in the text below:

ERR TACH	ERR MOTR	ERR WFS	ERR STRT	ERR STOP	ERR FLOW
Indicates a tachometer error.	Indicates a motor error.	Indicates a wire feed speed error.	Indicates an arc start error.	Indicates an arc stop error.	Indicates a gas flow error.

ERR COOL	ERR GND	ERR STUK	ERR TEMP	ERR LINE	ERR ARC
Indicates a coolant flow error.	Indicates a ground current error.	Indicates a wire stuck error.	Indicates a temperature error.	Indicates a line error.	Indicates an arc error.

ERR TACH

- **The tach error** occurs 2 seconds after the loss of tachometer feedback. The motor speed is regulated through the monitoring of tach feedback pulses. Press Jog/Purge button to clear error.

ERR MOTR

- **The motor error** indicates that the motor has been drawing too much current for too long. To remedy this, reduce the wire feed speed or the wire feeder torque load/duty cycle. Press Jog/Purge button to clear error.

ERR WFS

- **The wire feed speed error** indicates actual wire feed speed does not match wire feed speed command. Press Jog/Purge button to clear error.

ERR STRT

- **The start erro**r occurs if the user has the trigger held for more than 3 seconds without striking an arc, or if a valid arc voltage and current is not detected. The 3 second arc start error time can be changed using an optional PDA with File Management software.

ERR STOP

- **The stop error** occurs as result of obstructions in the wire feed system or a faulty wire drive system. Check wire feed and wire drive systems. Press Jog/Purge button to clear error.

ERR FLOW

- **The flow error** indicates no gas flow to the gun. The error may be reset by reestablishing gas flow to the gun, and then pressing the Jog/Purge button.

ERR COOL

- **The cool error** indicates no coolant flow in water flow switch option. The error may be reset by reestablishing coolant flow to the gun, and then pressing the Jog/Purge button.

ERR GND

- **The ground current error** occurs if weld current is detected in the earth ground connection. May be caused by a conductor making contact with unit chassis. Check and repair feeder weld connections. Turn power off and back on to clear error.

ERR STUK

- **The stuck error** occurs if the welding wire sticks to the workpiece at the end of a weld. May be caused by poor weld conditions. The error may be cleared by cutting wire from workpiece, and pressing the Jog/Purge button.

ERR TEMP

- **The temperature error** indicates welding power source has overheated and shutdown. The error may be cleared by allowing unit to cool down, and pressing the Jog/Purge button. If problem persists, check fan motors and thermistors for proper operation.

ERR LINE

- **The line error** indicates input power is outside of unit operating range. Check and correct input power. Press Jog/Purge button to clear error.

ERR ARC

- **The arc error** indicates an arc outage occurred possibly from an obstruction at the wire feeder or an arc outage greater than 0.5 seconds. Check wire feeder, gun and liner for any obstructions. Press Jog/Purge button to clear error.

7-2. Diagnostics (Continued)

WELD WAIT	MOTR COM	PLS WAIT	LOW WFS	E STOP	OVER AVG
Indicates a weld cycle wait error.	Indicates a motor communication error.	Indicates a UIM communication error.	Indicates a low WFS command error.	Indicates an emergency stop error.	Indicates an over average current error.

REL TRIG	TRIG STUK	ERR UNKN	OVER CRNT
Indicates a contactor on error.	Indicates a trigger closed error.	Indicates an unknown error.	Indicates an overcurrent error.

WELD WAIT

- **The weld wait erro**r indicates unit was not ready for a weld sequence. Press Jog/Purge button to clear error.

MOTR COM

- **The motor communication erro**r indicates motor board lost data communications. Press Jog/Purge button to clear error. If condition persists, contact nearest factory authorized service agent.

PLS WAIT

- **The uim communication erro**r indicates user interface board lost data communications. Press Jog/Purge button to clear error. If condition persists, contact nearest factory authorized service agent.

LOW WFS

- **The low wire feed speed erro**r indicates actual wire feed speed is lower than wire feed speed command. Check for obstructions in the wire feed system or a faulty wire drive system. Press Jog/Purge button to clear error.

E STOP

- **The emergency stop error** occurs if the user presses an emergency stop button. Reset the emergency stop button and press Jog/Purge button to clear error. Only applies to units equipped with E stop option.

OVER AVG

- **The over average error** indicates that current is outside the average range for the set program parameters. Check and correct program parameters. Press Jog/Purge button to clear error.

REL TRIG

- **The release trigger erro**r indicates the user held the gun trigger after an E stop was reset causing the contactor to remain on. Press Jog/Purge button to clear error.

TRIG STUK

- **The trigger stuck erro**r indicates the user held the gun trigger during power up. Release trigger and turn power off and back on.

ERR UNKN

- **The unknown erro**r indicates an error was sent from the PCM board to the UIM, but error condition is unknown. Make sure AROI is isolated from the welding fixture. Press Jog/Purge button to clear error.

OVER CRNT

- **The over current erro**r indicates welding power source primary current of the inverter is too high. **Turn welding power source off and disconnect unit for servicing. Attempting to reset the display to continue welding may further damage internal components.** A complete prepower check of the unit is needed including resistance measurements of R1 and R8 resistors on welding power source Interconnect board. Resistors should measure 30K ohms. Visually inspect electrolytic capacitors C1 and C2 for any possible damage. In the event of an over voltage condition, R1 and R8 could open potentially causing an imbalance in the power circuit. This condition would create excessive current in the inverter primary transformer and result in the OVER CRNT error.

Notes

SECTION 8 – ELECTRICAL DIAGRAM

⚠ WARNING

ELECTRIC SHOCK HAZARD

- Do not touch live electrical parts.
- Disconnect input power or stop engine before servicing.
- Do not operate with covers removed.
- Have only qualified persons install, use, or service this unit.

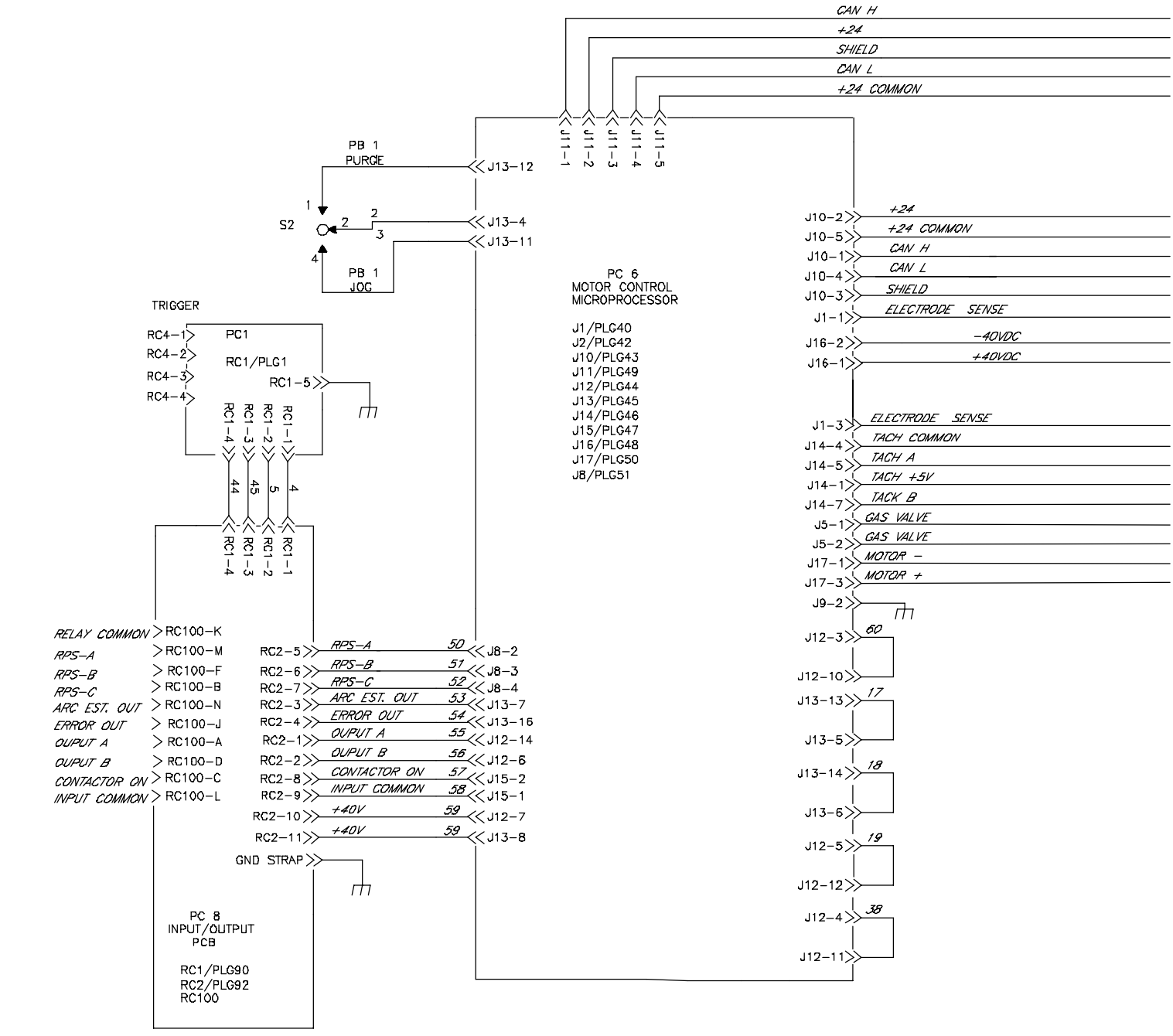
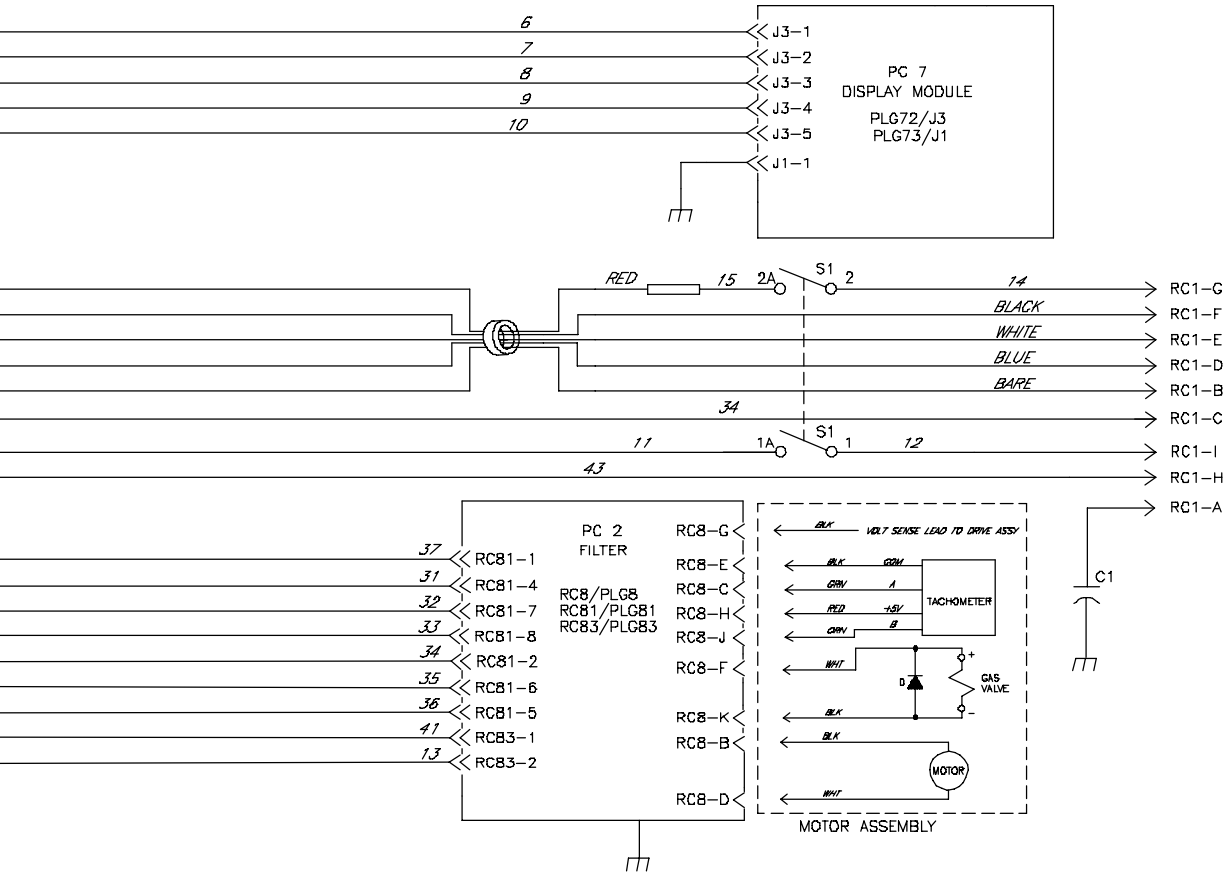


Figure 8-1. Circuit Diagram


6
7
8
9
10
J3–1
J3–2
J3–3
J3–4
J3–5
J1–1
PC 7
DISPLAY MODULE
PLG72/J3
PLG73/J1
RED
15
2A
S1
2
14
RC1–G
BLACK
RC1–F
WHITE
RC1–E
BLUE
RC1–D
BARE
RC1–B
34
RC1–C
11
1A
S1
1
12
RC1–I
43
RC1–H
RC1–A
C1
PC 2
FILTER
RC8/PLG8
RC81/PLG81
RC83/PLG83
37
RC81–1
31
RC81–4
32
RC81–7
33
RC81–8
34
RC81–2
35
RC81–6
36
RC81–5
41
RC83–1
13
RC83–2
RC8–G
RC8–E
RC8–C
RC8–H
RC8–J
RC8–F
RC8–K
RC8–B
RC8–D
BLK
VOLT SENSE LEAD TO DRIVE ASSY
BLK
COM
GRN
A
RED
+5V
GRN
B
TACHOMETER
WHT
D
+
GAS
VALVE
-
BLK
BLK
MOTOR
WHT
MOTOR ASSEMBLY

☞ *Hardware is common and not available unless listed.*

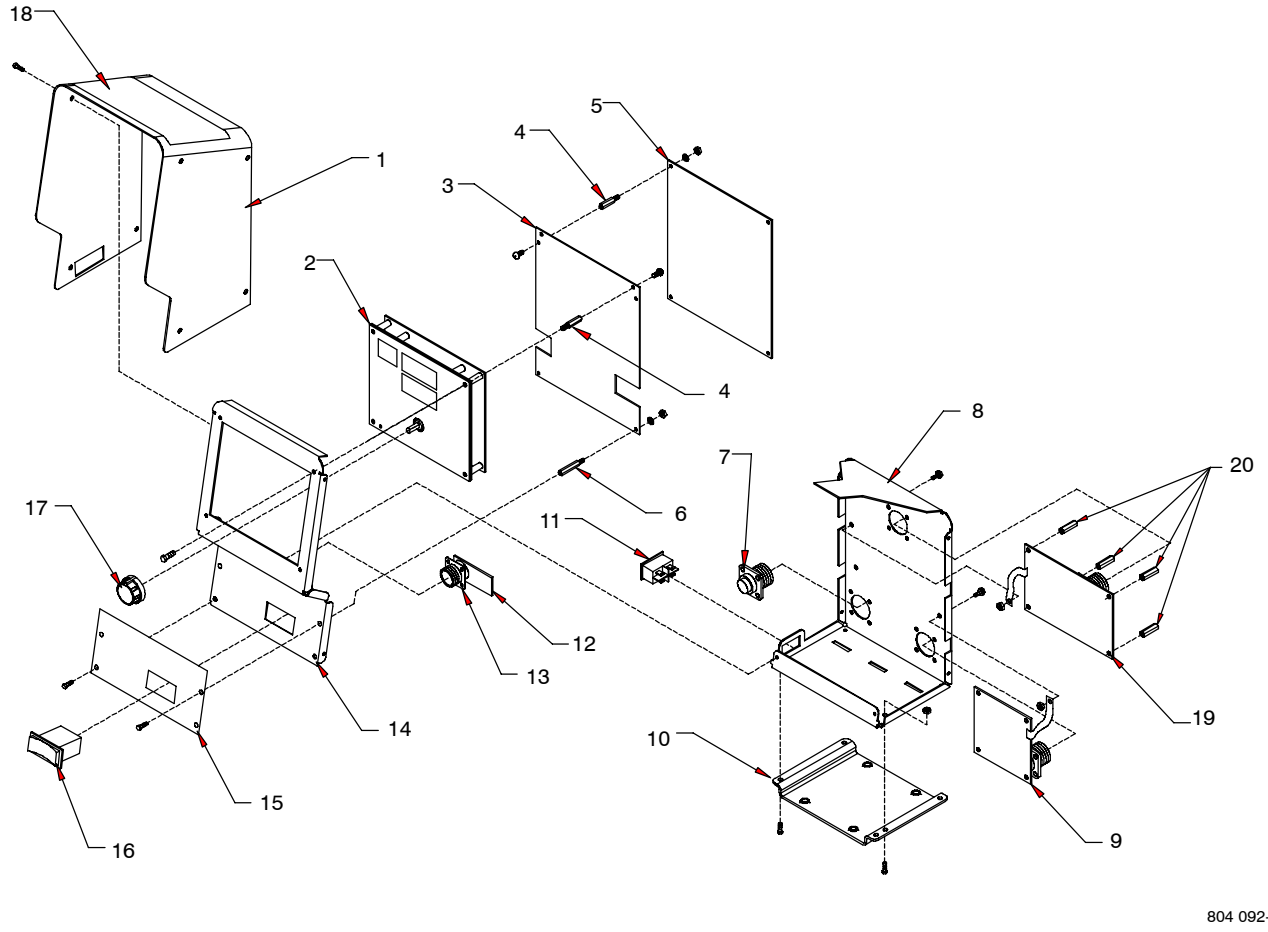


Figure 9-1. Remote Operator Interface

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
1		+214 839	WRAPPER, feeder	1
2		233584	PANEL, pc card switch/overlay	1
3		212 808	BAFFLE, pc mounting	1
4		097 132	STAND–OFF SUPPORT, pc card	6
5	PC6	221 280	WIREFEED MODULE	1
6		098 691	STAND–OFF, no 6–32 x .500 lg .250 hex stl m&f	2
7	RC1	211 018	CONNECTOR, circ 97/met 9 pin size 20 rcpt	1
	PLG40,43,48	115 093	HOUSING PLUG+SKTS, (service kit)	1
8		222 744	ENCLOSURE, control	1
9	PC2	217 362	CIRCUIT CARD ASSY, motor filter	1
10		200 553	BRACKET, mtg control box	1
11	S1	213 632	SWITCH, rocker dpdt 10A 250VAC/20A 30VAC on-none-on	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 9-1. Remote Operator Interface (Continued)

12	PC1	212 459	CIRCUIT CARD ASSY, trigger filter	1
13	RC4	048 282	RCPT W/SKTS, (service kit)	1
14		211 085	PANEL, front	1
15		223 536	NAMEPLATE	1
16	S2	223 537	SWITCH ASSY, jog/purge (including)	1
		200 295	SWITCH, rocker spdt 15A 12V (on)-off-(on)	1
		131 056	HOUSING PLUG+SKTS, (service kit)	1
		131 052	HOUSING PLUG+SKTS, (service kit)	1
17		179 851	KNOB, pointer 1.670 dia x .250 id push on w/spring	1
18		134 327	LABEL, Warning General Precautionary	1
19	PC8	222 200	CIRCUIT CARD ASSY, auto up I/O	1
20		144 844	STAND−OFF, no 6−32 X .875 lg .250 hex al fem	4
	PLG47	115 094	HOUSING PLUG+SKTS, (service kit)	1
	PLG48	202 592	HOUSING PLUG+SKTS, (service kit)	1
	PLG4	136 810	HOUSING PLUG+SKTS, (service kit)	1
	PLG81	115 092	HOUSING PLUG+SKTS, (service kit)	1
	PLG10	130 203	HOUSING PLUG+SKTS, (service kit)	1
	PLG50	136 810	HOUSING PLUG+SKTS, (service kit)	1
	PLG44	131 058	HOUSING PLUG+SKTS, (service kit)	1
	PLG45	188 352	HOUSING RCPT+SKTS, (service kit)	1
	PLG42	131 054	HOUSING RCPT+SKTS, (service kit)	1
	PLG40	201 665	HOUSING RCPTPLUG+SKTS, (service kit)	1
		224 363	KIT, insulator ROI (including)	1
		224 193	INSULATOR, plate ROI mounting	1
		159 360	INSULATOR, screw machine	4
		010 910	WASHER, flat .406 ID x .812 OD x .65 T stl pld	4
		604 224	SCREW, 250-20 x .75 hexwhd .50 D stl pld	4

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
*Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Notes

Notes

Notes

Warranty Questions?

Call
1-800-4-A-MILLER
for your local
Miller distributor.

Your distributor also gives you ...

Service
You always get the fast, reliable response you need. Most replacement parts can be in your hands in 24 hours.

Support
Need fast answers to the tough welding questions? Contact your distributor. The expertise of the distributor and Miller is there to help you, every step of the way.

Miller

TRUE BLUE® WARRANTY

Effective January 1, 2010
(Equipment with a serial number preface of MA or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the delivery date of the equipment to the original end-user purchaser, and not to exceed one year after the equipment is shipped to a North American distributor or eighteen months after the equipment is shipped to an International distributor.

1. 5 Years Parts — 3 Years Labor
   * Original main power rectifiers only to include SCRs, diodes, and discrete rectifier modules
2. 3 Years — Parts and Labor
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
   * Inverter Power Sources (Unless Otherwise Stated)
   * Plasma Arc Cutting Power Sources
   * Process Controllers
   * Semi-Automatic and Automatic Wire Feeders
   * Smith 30 Series Flowgauge and Flowmeter Regulators (No Labor)
   * Transformer/Rectifier Power Sources
   * Water Coolant Systems (Integrated)
3. 2 Years — Parts
   * Auto-Darkening Helmet Lenses (No Labor)
4. 1 Year — Parts and Labor Unless Specified
   * Automatic Motion Devices
   * CoolBelt and CoolBand Blower Unit (No Labor)
   * External Monitoring Equipment and Sensors
   * Field Options (NOTE: Field options are covered for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
   * Flowgauge and Flowmeter Regulators (No Labor)
   * RFCS Foot Controls (Except RFCS-RJ45)
   * Fume Extractors
   * HF Units
   * ICE Plasma Cutting Torches (No Labor)
   * Induction Heating Power Sources, Coolers, and Electronic Controls/Recorders
   * Load Banks
   * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
   * PAPR Blower Unit (No Labor)
   * Positioners and Controllers
   * Racks
   * Running Gear/Trailers
   * Spot Welders
   * Subarc Wire Drive Assemblies
   * Water Coolant Systems (Non-Integrated)
   * Weldcraft-Branded TIG Torches (No Labor)
   * Work Stations/Weld Tables (No Labor)
5. 6 Months — Parts
   * Batteries
   * Bernard Guns (No Labor)
   * Tregaskiss Guns (No Labor)
6. 90 Days — Parts
   * Accessory (Kits)
   * Canvas Covers
   * Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
   * M-Guns
   * MIG Guns and Subarc (SAW) Guns
   * Remote Controls and RFCS-RJ45
   * Replacement Parts (No labor)
   * Roughneck Guns
   * Spoolmate Spoolguns

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, relays, work station table tops and welding curtains, or parts that fail due to normal wear. (Exception: brushes and relays are covered on all engine-driven products.)**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

Owner's Record

Please complete and retain with your personal records.

Model Name	Serial/Style Number
Purchase Date	(Date which equipment was delivered to original customer.)
Distributor	
Address	
City	
State	Zip

For Service

Contact a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:	Welding Supplies and Consumables Options and Accessories Personal Safety Equipment Service and Repair Replacement Parts Training (Schools, Videos, Books) Technical Manuals (Servicing Information and Parts) Circuit Diagrams Welding Process Handbooks To locate a Distributor or Service Agency visit www.millerwelds.com or call 1-800-4-A-Miller
Contact the Delivering Carrier to:	File a claim for loss or damage during shipment. For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

Miller Electric Mfg. Co.
An Illinois Tool Works Company
1635 West Spencer Street
Appleton, WI 54914 USA

International Headquarters–USA
USA Phone: 920-735-4505 Auto-Attended
USA & Canada FAX: 920-735-4134
International FAX: 920-735-4125

For International Locations Visit
www.MillerWelds.com

ORIGINAL INSTRUCTIONS – PRINTED IN USA

© 2010 Miller Electric Mfg. Co. 2010–01